Raised Medians and Economic Impact on Adjacent Businesses

WILLIAM E. FRAWLEY AND WILLIAM L. EISELE

The use of raised medians in urban areas has increased in recent years. Raised medians restrict access to businesses along a corridor by limiting turning movements to select mid-block locations. Therefore, a very common remark at public hearings related to the construction of raised medians is that there will be detrimental economic impacts on adjacent businesses. However, the restricted access allows more efficient signalization and traffic flow along the corridor, potentially providing more customers for the businesses. Although many studies on the effect on traffic operations exist, little research is available on the economic impact from raised medians on adjacent businesses and properties. The authors of this paper have completed three years of work on this project by developing and testing methodologies to collect and analyze data related to the economic impact of raised medians on adjacent businesses for the Texas Department of Transportation (TxDOT). This paper summarizes the findings of key economic indicators, as well as perceptions of business owners and managers. The research has found that installation of a raised median does not equate to economic losses by adjacent businesses. In fact, only two types of businesses (auto repair shops and gas stations) were found to generally experience losses in gross revenues. In almost all cases, employment increased in businesses surveyed. This research is anticipated to be valuable for transportation professionals in both the public and private sectors who must provide estimates and expectations of the economic impacts of raised medians.

INTRODUCTION

In recent years, transportation agencies have increased construction of raised medians on urban and suburban arterials. In addition to their use for access control, raised medians provide improved traffic operations and safety for a facility by separating opposing traffic flows and removing left-turning vehicles from the through lanes. With respect to access control, raised medians restrict left turns to mid-block and intersection median openings. While improving the operations and arterial signal coordination, the economic impacts of restricting these left turns may be felt by owners of businesses and properties adjacent to the arterial. Extensive research has investigated and quantified the costs and benefits of constructing raised medians with respect to initial costs and benefits to motorists in terms of reduced delay and increased safety. Prior to this research effort, however, limited research has been conducted to aid in estimating the economic impacts of raised medians on sales and property values for adjacent business and undeveloped landowners.

W. Frawley, Texas Transportation Institute, 110 N. Davis Dr., Suite 101, Arlington, Texas 76013. W. Eisele, Texas Transportation Institute, Texas A&M University System, 3135 TAMUS, College Station, Texas 77843-3135.

Research Methodology

Participants in the survey included owners and managers of businesses adjacent to the corridors of interest. The research team first conducted a "windshield" survey to determine which businesses and land uses were present along the corridors in which the survey was to be administered. Business information (e.g., address and contact name) for each location was then obtained from the chamber of commerce, appropriate neighborhood/business groups, county appraisal district office, and/or telephone directories. For all but one of the corridors, the research team sent a letter of support from the local chamber of commerce or neighborhood association encouraging the business owners and managers to participate in the survey. Finally, reminder cards were sent to the five case studies where mail-out surveys were administered to encourage individuals to return the surveys.

Corridor Descriptions

The case studies include corridors with a variety of business mixes. Most of the corridors are in suburban-type areas with shopping centers and strip retail development. One of the corridors, Grant Avenue in Odessa, is located in a central business district. The specific types of development on the individual corridors range from completely retail to a mix of office, institutional, and retail. These development mixes drove the numbers of potential survey participants on each corridor. In addition, the cities included in the study reflect a variety of population sizes. The populations range from approximately 35,000 in McKinney to approximately 1.8 million in the City of Houston. Table 1 summarizes several different characteristics of interest for each of the 11 case studies.

RESEARCH RESULTS

Impacts on Passerby Traffic

Changes in passerby traffic, or "impulse buyers," are often of interest when considering the impacts of raised medians. A common perception of business owners, prior to construction, is that the raised median will restrict the amount of passerby traffic as motorists are required to take a more circuitous route to get to their business. It is interesting to note that the change in passerby traffic percentage observed by owners/managers is zero for those businesses that were present before, during, and after the raised median installation (group one). Conversely, the perception of those individuals on corridors where raised medians had not yet been installed (group two) ex-

TABLE 1 Case Study Locations

Street Name	City and Population	Before Constr.	After Constr.	Study Limits	Length (km)	Age	Survey Type	Land Use	Number of Establishments
Texas Avenue	College Sta. 64,119	TWLTL	Raised Median	University Dr. to Dominik Dr.	2.4	Under Constr.	Interview	Retail, University	130
South Post Oak Road	Houston 1,841,064	Undivided	Raised Median	I-610 to South Main Street	2.4	8	Interview	Retail, Industrial	155
Clay Road	Houston 1,841,064	Undivided	Raised Median	Hollister Road to Gessner Road	3.6	2	Mail-out	Retail, Industrial, Undeveloped	63
West Fuqua Road	Houston 1,841,064	Undivided	Raised Median	Hiram Clarke Road to Almeda Road	2.4	9	Mail-out	Retail, Undeveloped	68
Long Point Road	Houston 1,841,064	Undivided	Raised Median	Campbell Road to Hollister Road	1.1	Pre-constr.	Mail-out	Retail	41
Twin Cities Highway	Port Arthur 58,582	Raised Median	TWLTL	53rd Street to Griffing Park	3.2	13	Mail-out	Retail, Office	90
9th Avenue	Port Arthur 58,582	Undivided	Raised Median	Texas 365 to Lake Arthur Drive	2.4	18	Mail-out	Retail, Residential, Undeveloped	66
University Drive	McKinney 34,979	Undivided	Raised Median	U.S. 75 to Texas Highway 5	2.2	6	Interview	Retail, Residential	132
Loop 281	Longview 75,973	Flush Median	Raised Median	Spur 63 to Spur 502	1.0	2	Interview	Retail	65
Call Field Road	Wichita Falls 98,161	Undivided	Raised Median	Kemp Blvd to Lawrence Street	0.5	Pre-constr.	Interview	Retail	55
Grant Avenue	Odessa 95,384	Undivided	Raised Median	2nd Street to 8th Street	1.0	6	Interview	Retail, Office	42

pected an average of a five-percent increase in passerby traffic. In addition, those business owners that arrived during the median construction phase (group three) indicated that they expected a nearly three-percent decrease in passerby traffic. Finally, those individuals that arrived after the raised median installation (group four) indicated a perception that passerby traffic increased by 12.0 percent. The research also found some variances in passerby traffic observations and expectations, depending on the business type. Among group one businesses, it was observed that fast-food restaurants and other services indicated an increase in passerby traffic. Specialty retail, auto repair, and one gasoline station indicated a decrease in passerby traffic. Sit-down restaurants, medical, grocery, and durables retail businesses indicated no change in passerby traffic.

Importance of Access to Customers

One of the survey questions asked business owners to rank "accessibility to business" with other factors including distance to travel, hours of operation, customer service, product quality, and product price in ascending order that customers consider when selecting a business of their type. The results of this analysis by business group are shown in Table 2. Accessibility to store ranked fourth or lower for each business group. Further, some combination of customer service, product quality, and product price always ranked first, second, and third. This indicates that, according to the business owners, the most important of these elements used by customers to determine which businesses they will patronize are factors that may be controlled by business owners themselves.

TABLE 2 Relative Importance of "Accessibility to Store" by Business Group

Business Group	Distance to Travel	Hours of Operation	Customer Service	Product Quality	Product Price	Accessibility to Store
1	6	5	1	2	3	4
2	6	5	1	2	3	4
3	5	4	2	1	3	6
4	5	6	1	2	3	4

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before the median construction and construction is yet to begin; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.

Impacts on Employment, Property Values, Accidents, and Traffic Volume

Impacts upon employment, property values, accidents, and traffic volume are also of interest. Results of these factors by business group are shown in Table 3. For all business groups, after the construction period there has been at least a small growth in the number of full-time employees. Part-time employees decreased for business groups one and two after construction relative to before construction. Part-time employment also decreased during construction relative to before construction (i.e., "during" group is higher than the "before" group). Estimated property values were indicated as increasing 7.7 percent after the raised median installation by group one business owners, while the perception of the group two businesses was that there would be a decrease. The business owners also noted observing decreases in the numbers of accidents after the medians were installed. The group four businesses perceived that the number of accidents was likely higher by 6.7 percent. This is an interesting contrast to the group one business owners that were actually present before, during, and after the median installation. Finally, traffic volumes were indicated as higher after the raised median installation and lower during the construction, relative to before the construction, for all business groups.

Impacts on Customers Per Day and Gross Sales

Table 4 illustrates the impacts on customers per day and gross sales for the four business groups. "Gross sales where the median installed" refers to a question posed to business owners in which they were asked what they believe was/is the impact of the raised median for all businesses along the corridor where the median was installed. "Gross sales in the area" refers to a similar question that asked about gross sales for all other businesses in the area (not necessarily just the corridor) due to the raised median installation. One can quickly notice from Table 4 that the construction phase did seem to impact customers per day and gross sales as evidenced from the values in the "during" columns. Perceptions again seem to indicate a larger expected loss in the group two businesses, which predicted an 18.6 percent reduction, while those that were present before, during, and after the median installation (group one) noted a 10.7 percent reduction. Group one businesses also indicated an increase in customers per day and gross sales after the median installation while the group two businesses believed that there would still be a decrease. Group one also indicated an increase after the median was installed for all businesses along the corridor where the median was installed and in the community surrounding the roadway improvement.

TABLE 3 Percent Change of Employment, Property Values, Accidents, and Traffic Volumes

Business Group	Full-time Employees		Part-time Employees		Property Values		Accidents		Traffic Volume	
	During	After	During	After	During	After	During	After	During	After
1	11.9%	0.1%	-2.3%	-3.3%	1.8%	7.7%	6.6%	-12.7%	-13.5%	37.6%
2	-0.3%	0.3%	-0.2%	-1.0%	-8.2%	-2.3%	-3.3%	-13.2%	-11.1%	7.9%
3	-8.3%	12.5%	-8.3%	0.0%	-7.0%	5.5%	-10.0%	-15.0%	-11.7%	34.2%
4	0%	7.1%	0.0%	6.3%	-15.6%	7.7%	0.0%	6.7%	-21.9%	37.7%

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before the median construction and construction is yet to begin; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.
Note: The "during" column indicates impacts during construction relative to prior to construction, and the "after" column indicates impacts after construction relative to prior to construction.

TABLE 4 Percent Change of Customers per Day and Gross Sales

Business Group	Customers per Day		Gross Sales		Gross Sales Where Median Installed		Gross Sales in the Area	
	During	After	During	After	During	After	During	After
1	-12.1%	24.4%	-10.7%	0.2%	-15.8%	9.4%	10.0%	1.5%
2	-9.5%	-5.9%	-18.6%	-0.8%	-14.2%	5.4%	11.8%	2.7%
3	-16.7%	-8.6%	-20.0%	-0.1%	-10.8%	10.0%	5.0%	-6.0%
4	0.0%	50.0%	0.0%	0.3%	-20.4%	12.9%	9.5%	5.9%

Note: Business Group 1 = businesses present before, during, and after median installation; Business Group 2 = businesses present before the median construction and construction is yet to begin; Business Group 3 = businesses present during and after median installation; and Business Group 4 = businesses present only after the median has been installed.
Note: The "during" column indicates impacts during construction relative to prior to construction, and the "after" column indicates impacts after construction relative to prior to construction.

TABLE 5 Percent Changes for Customers per Day, Gross Sales, and Property Values for Businesses Present Before, During, and After Raised Median Installation

Business Type	Percent Change in Responses of Interest					
	Customers Per Day		Gross Sales		Property Values	
	During	After	During	After	During	After
Durables Retail	15.0%	5.0%	15.0%	1.0%	0.0%	17.5%
Specialty Retail	-6.8%	7.8%	-4.2%	0.6%	-1.0%	3.7
Gas Station	25.0%	-5.0%	-25.0%	-1.5%	25.0%	30.0%
Fast-food Restaurant	-33.0%	146.3%	-22.0%	0.2%	-1.7%	16.7%
Sit-down Restaurant	-2.5%	1.3%	-1.0%	0.8%	0.0%	0.0%
Medical	-10.0%	0.0%	-10.0%	0.0%	-10.0	30.0%
Auto Repair	-30.0%	-6.3%	-24.0%	-0.6%	3.3%	3.3%
Other Services	-30.0%	-13.3%	-18.3%	-0.7%	10.0%	15.0%

Note: The "during" column indicates impacts during construction relative to prior to construction, and the "after" column indicates impacts after construction relative to prior to construction.

Impacts on Customers per Day, Gross Sales, and Property Values by Business Type

Table 5 provides results of analysis for group one businesses that have been present before, during, and after the median installation. The table presents the average percent change, standard deviation, and sample size by business type. The data presented in the table indicate that the construction phase can have impacts upon customers per day, gross sales, and property values for many of the business types interviewed. It is interesting to note that business types such as specialty retail (e.g., clothing stores, bookstores, hobby-related stores, etc.), fast-food restaurants, and sit-down restaurants indicated increasing customers per day, gross sales, and property values after the median installation. The gas stations, auto repair, and other service businesses indicated decreasing customers per day and gross sales after the raised median was installed.

For mid-block, shopping center and specialty retail businesses, the number of full- and part-time employees was noted as being reduced after the installation of the raised median. The "before only" businesses of this type also had harsher expectations than experienced by those business owners present before, during, and after the installation of the raised median for property values, accidents, customers per day, and gross sales. These business owners also indicated a decrease in their customers per day during construction yet no change in their gross sales during the construction.

None of the corridors experienced decreasing gross sales after the construction phase except for McKinney, which experienced some decrease in gross sales the year following construction.

ADDITIONAL FINDINGS

It should be noted that the sample sizes upon which analyses were performed were often rather small; however, many observations and interesting points may be drawn from this research effort. The in-person surveys appear to provide more reliable data than the mail-out surveys, and these survey respondents appreciate the face-to-face opportunity to have their opinions heard. The average response rate for the in-person surveys was also much higher (62.0 percent) than the response rate for the mail-out surveys (9.0 percent).

When combining all business types, it was found that 93.6 percent of business owners whose businesses were present before, during, and after the median installation felt that their regular customers would be at least as or more likely to patronize their businesses. In contrast, those businesses that were interviewed prior to the installation of the raised median indicated this percentage slightly lower at 81.0 percent.

The construction phase seemed to impact customers per day and gross sales. Perceptions again seem to indicate a larger expected loss in the group two businesses (before only) indicating an 18.6 percent reduction while those that were present before, during, and after the median installation (group one) noted a 10.7 percent reduction. The "before" group also indicated an increase in customers per day and gross sales after the median installation while the "before only" businesses believed that there would be a decrease. Business types such as specialty retail, fast-food restaurants, and sit-down restaurants indicated increasing customers per day, gross sales, and property values after the median installation. Gas stations, auto repair, and other service businesses indicated decreasing customers per day and gross sales after the raised median was installed. (*1*)

REFERENCE

This entire paper is based on the following report:

1. Eisele, W.L. and W.E. Frawley. *A Methodology for Determining Economic Impacts of Raised Medians: Data Analysis on Additional Case Studies*. Texas Transportation Institute. College Station, Texas, 1999.